DATE: NOV 5 1976
REV: April 27,1982

FAULT LIMITER 27KV, SUBMERSIBLE GAS INSULATED

1. General

This specification covers submersible energy-limiting device to protect distribution transformers against low impedance faults on a grounded wye, 26 Grd. Y/15kv distribution system. The device is to be used in 1Ø and 3Ø underground systems.

2. Ratings

(2.1) The voltage rating shall be 27kv 3Ø, 27kv Ø to Ø and 15.5kv Ø to N.

(2.2) The interrupting rating shall be 50,000 amperes RMS symmetrical minimum.

(2.3) The basic insulation level (BIL) shall be 125kv.

(2.4) The continuous current rating shall be 50 amperes.

3. Insulation

(3.1) The fault limiter shall be insulated with sulfur hexafluoride (SF_6). Oil is not acceptable.

4. Bushings

(4.1) The submersible fault limiter shall be equipped with two bushing wells welded to the cover. The bushing wells shall be 200 ampere, 125kv BIL, Elastimold Catalog No. K1601-PC-T1 or K1601-PC-S1. Other bushing wells are not acceptable. Gasketed bushing wells are not acceptable.

(4.2) The bushing wells shall be spaced apart not less than 6" nor more than 16".

(4.3) The bushing wells shall have a cover or cap to prevent the entrance of moisture or dirt during shipping and storage. The cap shall be secured to prevent its loss.

5. Fault Limiter

(5.1) The fault limiter shall be per Seattle City Light material specification 6840.2 except:

(a) Shall not be sealed for use outdoors.

(b) The terminals shall be 5/32" o.d. x 2" studs.

(c) The limiter shall not exceed 3" o.d. and shall be 15 3/4" in length measured between the tips of the studs.

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6. Tank Ground

(6.1) The tank ground shall consist of one stainless steel pad or nut with a 1/2", 13 NC tapped hole, 5/8" deep and shall be located on the tank cover and shall be coated with an oxide-inhibiting compound before installation of the ground connector.

(6.2) One ground connector shall be furnished that will accommodate #4 through 1/0 awg stranded wire. The stud threads shall be 1/2", 13 NC, class 2 fit.

7. Tank Construction & Finish

(7.1) The tank and all fittings welded thereto shall be 304 stainless steel. The tank cover shall be welded on. The tank shall be hermetically sealed for complete submersion in up to 15' of water.

(7.2) One lifting lug with 3/4" dia. hole shall be welded to the tank.

(7.3) The tank shall be equipped with a pressure monitoring device such as a Schrader valve.

(7.4) The tank shall have suitable mounting brackets designed for wall mounting with the bushings on the top. The mounting brackets shall hold the tank in a slightly tilted position such that water will not stand on the top. Adjustable brackets are desirable.

(7.5) The tank shall be capable of withstanding both full vacuum and 30 psi positive pressures.

8. Name Plate

(8.1) A corrosion-resistant diagrammatic name plate shall be affixed to the tank cover.

(8.2) The name plate shall state:

a. Manufacturer of complete unit
b. Model number or catalog number of complete unit
c. Year of manufacture
d. Manufacturer of limiter
e. Model number or catalog number of limiter
f. All voltage ratings
g. Interrupting rating
h. B.I.L.
i. Continuous current rating
j. Insulation medium (SF_6)
k. Maximum and minimum tank pressures
l. Weight
m. Any and all precautionary information
n. Diagrammatic connection diagram

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9. Tests

(9.1) The submersible limiter may be tested for radio influence voltage in accordance with NEMA Pub. 107, figure 1, tuned to one megahertz. The RIV levels shall be in accordance with NEMA TRI-0.06, except the test voltage shall be 17.4 kv. The RIV shall not exceed 250 micro-volts.

(9.2) SF_6 shall be tested per ASTM D2472, standard specification for sulfur hexafluoride.

(9.3) Gas leakage. The tank shall be tested in the final form and shall not have a leakage rate greater than 1×10^{-5} cc/sec at a positive pressure of 15 psi for 24 hours.

10. Data to be submitted with bid

(10.1) Each bidder shall submit with his proposal the data listed below. He shall submit a description of any changes, additions or exceptions to this specification together with the reasons for the departure. Product evaluation and conformance to this specification will be determined solely on the information submitted. The drawings and data furnished must be of sufficient detail and clarity to enable making a complete and positive check with the technical provisions of the specification.

(a) Outline drawings with overall dimensions
(b) Details of bushings and connections to the limiter
(c) Information concerning details of construction and tank materials
(d) Information regarding SF_6 gas
(e) Complete fault limiter information as specified in material specification 6840.2, data to be submitted with each bid, except item E of specification 6840.2.
(f) State all tests to be given at factory and whether these tests apply to all units or only sample units.
(g) Total weight
(h) Provide information on each type of material used
(i) General maintenance information - i.e., recharging of gas.

11. Data to be supplied by the successful bidder

(a) 6 copies of all tests
(b) 6 copies of outline drawings (limiter & tank)
(c) 6 copies of the name plate (limiter & tank)
(d) 6 copies of an instruction book covering installation, operation, limiter replacement and maintenance
(e) 6 copies of details showing bushings, limiter and connections.

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12. The manufacturer shall warrant the submersible fault limiter to be free of defects or workmanship and materials when used for the applications as stated in this specification (3Ø submersible operation @ 27 kv) for a period of 12 months after being energized or 18 months after delivery. Any defect in design, material and/or construction within this period shall be corrected on all units furnished at the manufacturer's expense, either by repair or replacement.

13. Award of bid

These are primarily performance specifications which allow great freedom in the exercise of engineering and manufacturing skill in the use of available materials to produce fault limiters which meet or exceed the minimum standards of performance herein specified.

It is recognized, therefore, that there may be considerable variation in design and construction of the equipment proposed to be furnished by the various bidders.

In determining the lowest and best bid, consideration will be given, but not restricted to:

(a) the bidder's experience and facilities for designing, manufacturing, testing and servicing of fuses of equivalent rating and voltage class
(b) bid price
(c) evaluation of difference in construction revealed in the proposals which may affect safety, installation and/or maintenance costs
(d) field experience with unit of the type bid and manufacturer's performance record
(e) although no nationally recognized standards are completely applicable to this submersible limiter, Seattle City Light reserves the right to apply any portion of any other existing standards that the City deems applicable.

Stock Number	APPROVED MANUFACTURERS
684908	

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